JEJUNAL ATRESIA: HOW TO DIAGNOSE

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ABSTRACT

Intestinal atresias are a common cause of bowel obstruction in newborns. Jejunoileal obstruction was found in 46% of the intestinal atresias. The classification of jejunoileal atresias is defined by 4 types of lesions. Jejunal atresia (JA) is generally considered to result from intrauterine vascular disruptions in a segment of the developed intestine. Destructive events such as volvulus, herniation, constriction, and intussusception have been observed during surgery in patients with JA. Early and prompt diagnosis and appropriate treatment have improved these patients' outcomes. Rapid diagnosis is important in the treatment of this anomaly.

Key words: Newborn, intestinal atresia, surgery, small intestine, abnormalities, intestinal obstruction, diagnosis, jejunal diseases, differential

INTRODUCTION

Intestinal obstruction in newborn infants and older children may be due to a variety of conditions, including atresia and stenosis, annular pancreas, malrotation, duplication cyst, meconium ileus, meconium plug syndrome and neonatal small left colon syndrome, Hirschsprung's disease, neoplasia, trauma, and other, rarer causes. [1]

Intestinal atresias are common causes of neonatal intestinal obstructions and account for approximately one-third of cases of obstruction in newborns, with incidence of approximately 1 in 2,700 births. The mortality of the condition was 90% prior to 1950, but this declined sharply and remains at approximately 10%.[2] Other studies show incidence of 1 in 5,000 newborns. [3 - 4] The male to female ratios in jejuno-ileal atresia are 1.17:1.[5]

The 2 major theories regarding the etiology of intestinal atresia are Tandler's concept of a lack of revacuolization of the solid cord stage of intestinal development and the classic study by Louw and Barnard suggesting that a late intrauterine mesenteric vascular accident causes most jejunoileal and colonic atresias [6 - 7]. While lack of revacuolization is the probable cause for most cases of duodenal atresia, compelling observations from other studies demonstrate that jejunoileal atresias occur as a result of intestinal volvulus, intussusception, internal hernia, or strangulation in a tight gastroschisis or omphalocele

defect.[8 - 9] Furthermore, jejunal atresia has been associated with volvulus without a mesenteric vascular anomaly. [10]

Jejunoileal atresia is usually classified into 5 major types: type I (a completely occluding web), type II (proximal and distal segments separated by a cord), type IIIa (complete separation with a mesenteric defect), type IIIb (proximal jejunal atresia with complete absence of the mesentery to the distal small bowel, the so-called "Christmas tree" or "apple peel" atresia), type IV (multiple atresias) and type V (stenosis) (Figure 1).[11 - 12] In type IIIb, the distal bowel survives on the marginal branches from the ileocolic vessels and is prone to volvulus and necrosis. Unlike congenital duodenal obstruction, associated anomalies are uncommon with jejunoileal atresia, and they tend to involve the gastrointestinal system when they do occur. [13 - 15] Our case does not conform to any of these types, and instead presented a mixture of type I and type IIIa. This atresia included fenestrated mucosal web with minimal mesenteric defect (Figure 2). [16]

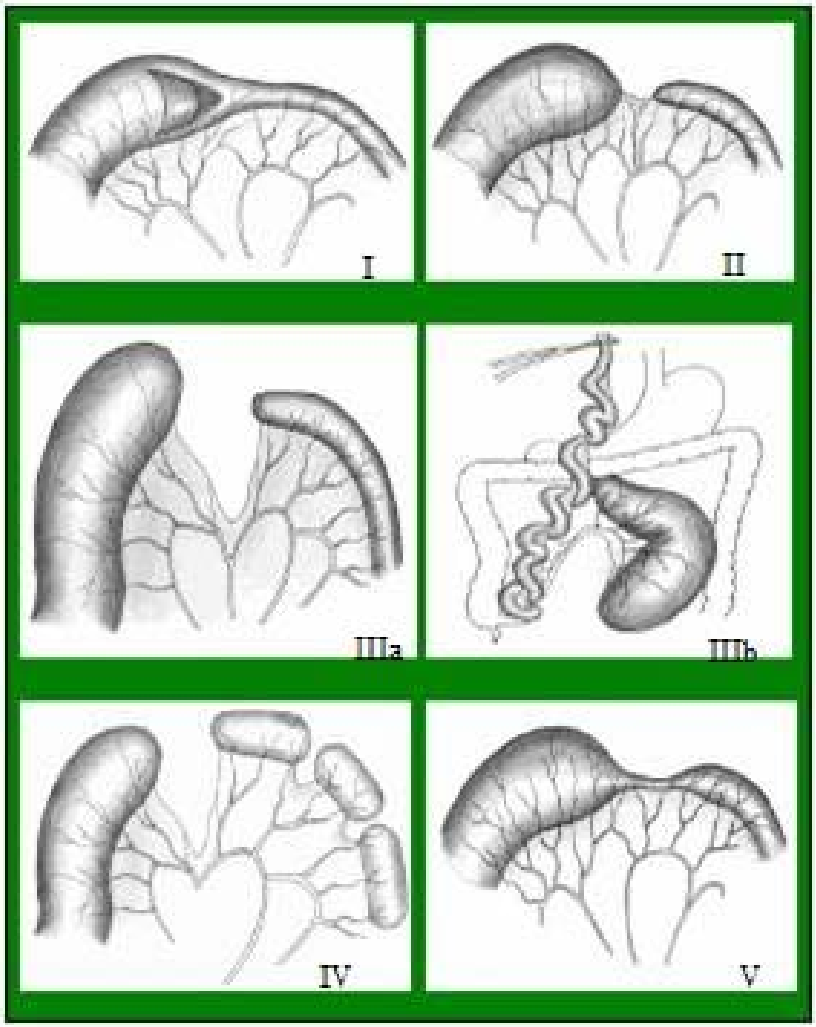

Figure 1. Type of atresias. (Reprinted from Başaklar C. Bebek Ve Cocukların Cerrahi Ve Urolojik Hastalıklari with permission from Palme Yayincilik Inc – Medical Books, Turkey 2006 Year Book, formerly).

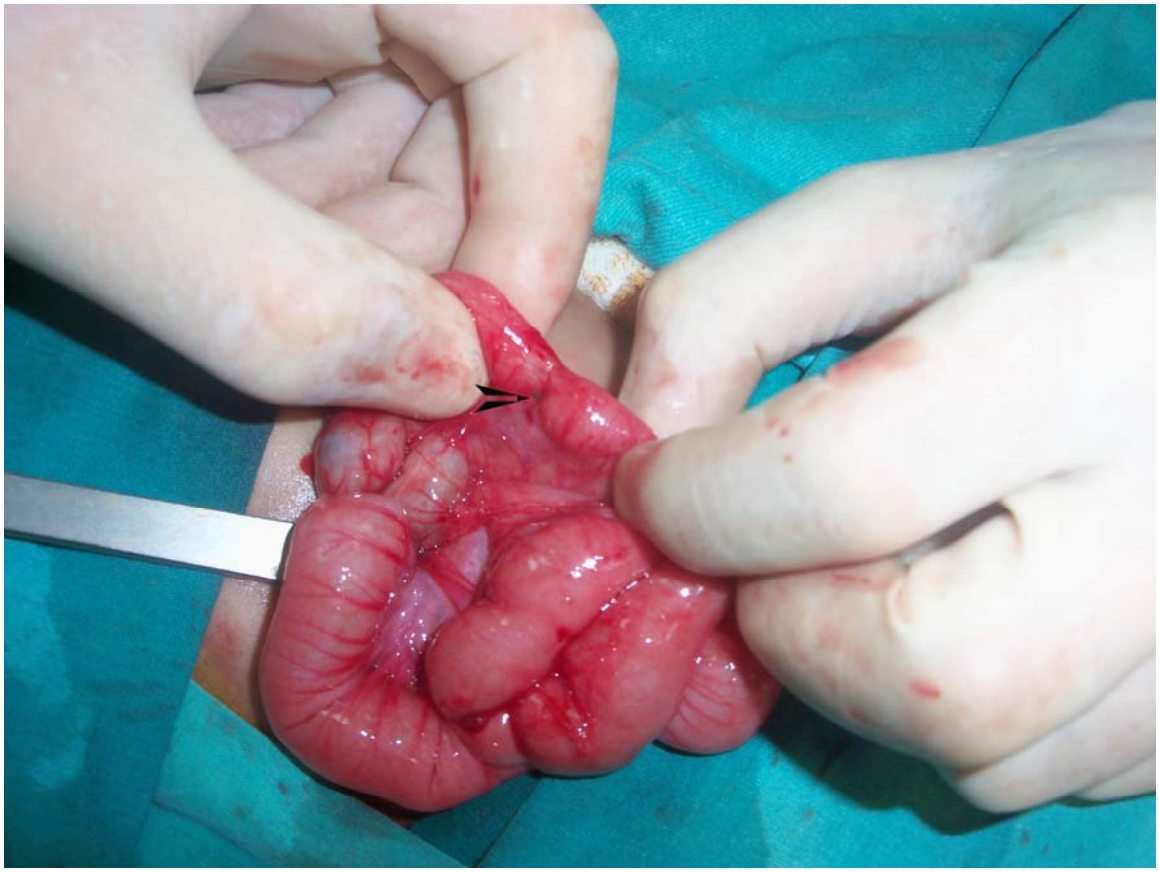

Figure 2. This different atresia included fenestrated mucosal web with minimal mesenteric defect.

CLINICAL PRESENTATION

The pertinent signs of jejunal atresia include maternal polyhydroamnios. The infant is usually referred to a pediatric surgeon within the first 24-48 hours of life with bilious vomiting, abdominal distention, jaundice, and failure to pass meconium (70%). Bilious vomiting is slightly more common in jejunal atresia. Upper abdominal distension may be associated with proximal jejunal atresia (Figure 3). Severe distention may be associated with respiratory distress because of elevation of the diaphragm. The differential diagnosis includes meconium disease, Hirschsprung's disease, small left colon syndrome, malrotation, and intussusception. Conditions associated with jejuno-ileal atresia include other intestinal atresias (10-15%), Hirschsprung's disease, biliary atresia, polysplenia syndrome (situs inversus, cardiac anomalies, biliary atresia, intestinal atresia), and cystic fibrosis (10%). [17]

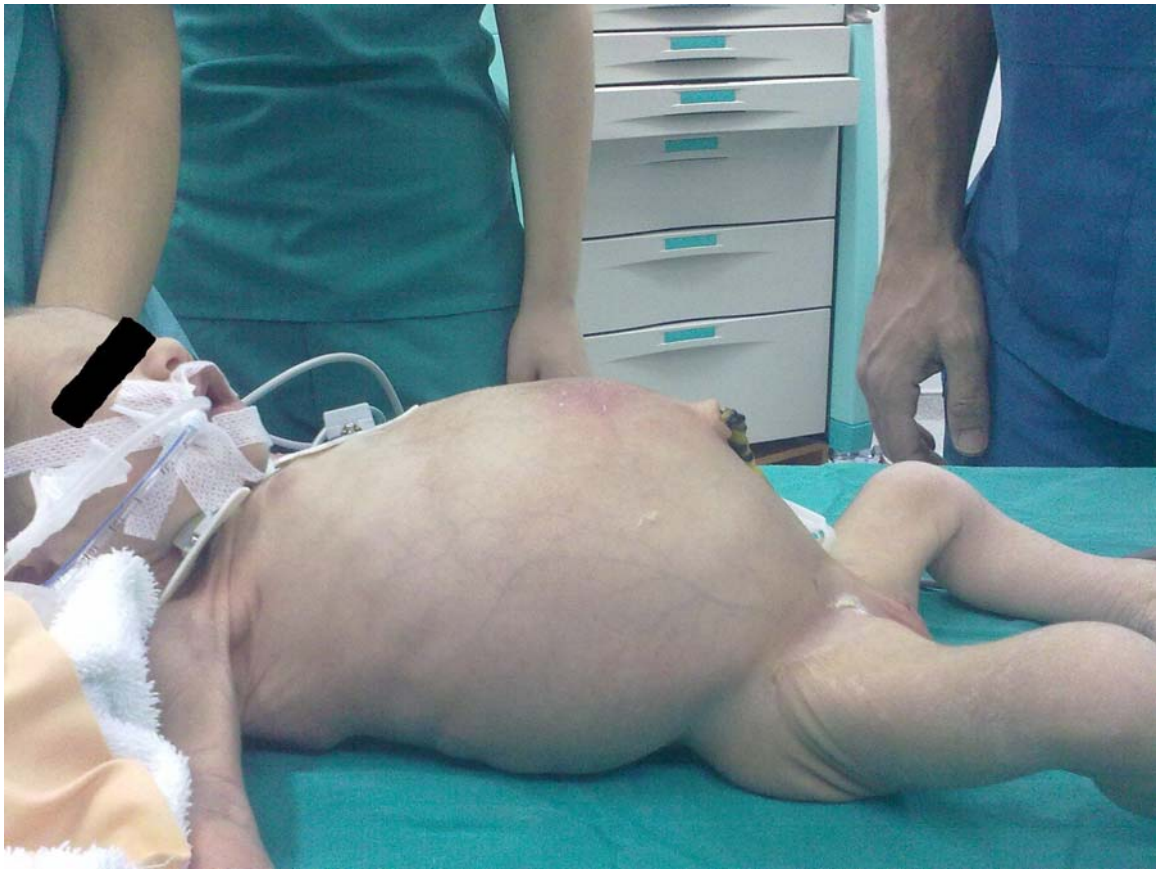

Figure 3. Abdominal distention and redness abdominal wall.

DIAGNOSIS

Various studies have evaluated the need to perform prenatal examination early (after 18 weeks' gestation) and have shown the benefit of prenatal diagnosis with earlier recognition, prompt surgical intervention, and fewer metabolic complications.[18 - 19] Prenatal ultrosonography in mothers with polyhydroamnios and distension of the stomach and duodenum with swallowed amniotic fluid has identified jejunal and small bowel obstructions. In jejunal atresia, erect and recumbent abdominal films show dilated loops of bowel with air fluid levels (Figure 4). High jejunal atresia may present with a few air fluid levels and no further gas beyond that point. If perforation has occurred, free air and/or peritoneal calcifications may be present (12% of cases) (Figure 5). Barium enema demonstrates a small unused colon and often shows reflux of contrast into a collapsed terminal ileum.

There is usually no indication to perform upper gastrointestinal contrast studies in instances of complete obstruction. In cases of intestinal stenosis, however, with an incomplete obstruction, this study may prove quite useful.[17]

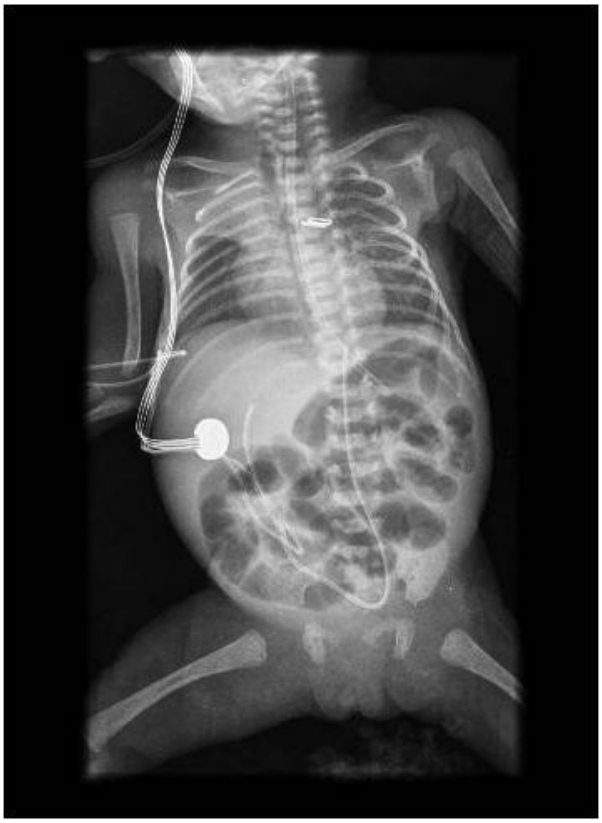

Figure 4. Dilated loops of bowel with air fluid levels in abdominal radiogram.

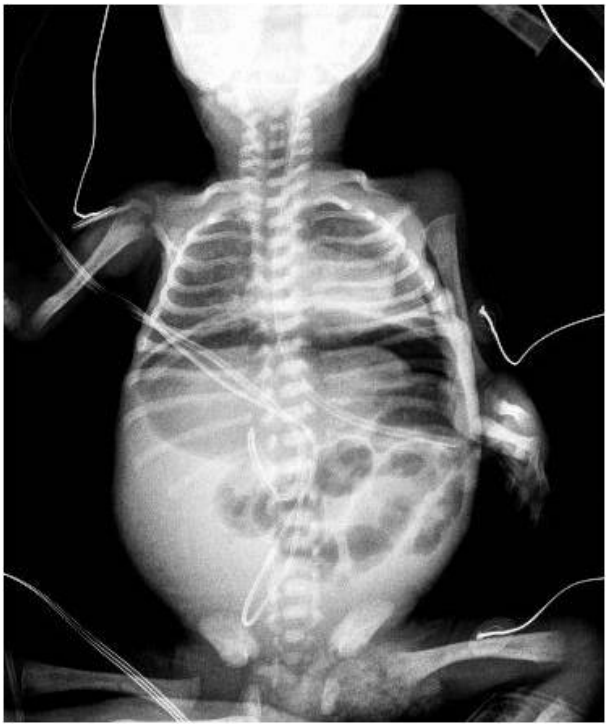

Figure 5. Subdiaphragmatic free air for perforation of jejenum.

DIFFERENTIAL DIAGNOSES

Neonate with intestinal obstruction from other causes may present with a clinical picture quite similar to that of infant with jejunal atresia. These causes include annular pancreas, malrotation, volvulus, anterior portal vein, second distal web, meconium ileus, intestinal duplication, internal hernia, colonic atresia, adynamic ileus related the sepsis, ectopic pancreatic rests, meckel diverticulum, total colonic aganglionosis, meconium plug syndrome and neonatal small left colon syndrome, neoplasia, trauma, and other rarer causes.[1]

ESSENTIALS OF TREATMENT

Postnatal management includes nasogastric aspiration to minimize abdominal distension and gastric secretions, peripheral venous access for intravenous fluids, frequent monitoring of temperature, urethral catheter placement, pulse, respiratory rate, blood pressure, some blood abstractions, and intravenous prophylaxis.[20] Treatment consisted of intravenous fluid with 10% dextrose in 0.25% or 0.33% normal saline solution (1-2 mL/kg/hr). [16, 20]

Jejunal atresia operative treatment includes wide proximal resection with end-to-end anastomosis minimal resection with antemesenteric tapering enteroplasty and end-to-end anastomosis.

If the newborn had jejunal atresia with volvulus, surgical inspection as soon as the newborn was stable showed:

i) fetal peritonitis, with many epiploon adherences, and

ii) jejunal atresia with volvulus of post-atresic small bowel since about 30 cm from ileo-cecal valve (ICV) followed by a not-used microileus and microcolon.

The major components of surgical intervention were:

i) lysis of adhesions, and

ii) resection of volvulated necrotic small bowel followed by primary anastomosis. [21 - 22]

Postoperative complications included:

i) adhesive bowel obstruction (early and late),

ii) prolonged adynamic ileus,

iii) enterostomy prolapse,

iv) pneumonia,

v) wound infection, and

vi) anastomotic leak with abscess or fistula. [2]

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